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November 22, 2011

Arizona Corporation Commission
DOCKETED
NOV 22 2011
DOCKETED BY

HAND DELIVERED

Docket Control
Arizona Corporation Commission
1200 W. Washington St.
Phoenix, AZ 85007

Re: *Southwest Transmission Cooperative's ("SWTC") Technical Study in Compliance with Condition 13(b) of Decision No. 72447; Docket No. L-00000CC-11-0127-00161; Case No. 161*

Dear Sir or Madam:

Attached is the Technical Study addressing Condition 13(b) of Decision No. 72447. A copy is being delivered to Utilities Division Staff. Your assistance is appreciated.

Very truly yours,

GALLAGHER & KENNEDY, P.A.

By:
Michael M. Grant

MMG/plp
15169-17/2920085
Attachment

cc w/attachment (delivered): Steve Olea, Utilities Division
Prem Bahl, Utilities Division

Original and 25 copies filed with Docket Control this 22nd day of November, 2011.

MARANA TAP TO SANDARIO TAP TRANSMISSION LINE REBUILD PROJECT

A TECHNICAL STUDY REPORT TO ADDRESS CONDITION 13(b) of ACC DECISION NO. 72447

Prepared By
Transmission Planning
November 22, 2011

EXECUTIVE SUMMARY

The Arizona Corporation Commission's ("ACC" or "Commission") Decision No. 72447 for the Marana Tap to Sandario Tap Transmission Line Rebuild Project ("Project") contained several conditions in the granting of a Certificate of Environmental Compatibility ("CEC") to Southwest Transmission Cooperative, Inc. ("SWTC") including Condition 13(b) which states:

> *"Perform a technical study simulating an outage of the Project that may be caused by the collocation of the Project parallel and within 100 feet of the existing natural gas or hazardous liquid pipeline. The study should either: i) show that such outage does not result in customer outages; or ii) include operating plans to minimize any resulting customer outages. Applicant shall provide a copy of this study to Commission Staff and Docket Control."*

This report has been prepared to address Condition 13(b) and to show that an outage of the Marana to Avra 115 kV line, which is a segment within the Project, and which lies in parallel to a Southwest Gas Corporation ("SWG") 2" high pressure gas line, does not result in customer outages.

SWTC determined that approximately 5.7 miles south of Marana Substation, the Marana to Avra 115 kV line segment of the Project is in parallel for one mile with a SWG 2" high pressure gas line. Attachment 1 of this report shows the location of this SWG 2" high pressure gas line that is parallel to the Marana to Avra 115 kV line. There are no other 115 kV line segments within the Project that lie in proximity to or are parallel to an existing natural gas or hazardous liquid pipeline.

The Marana to Avra 115 kV line is currently looped between two sources: 1) The Arizona Public Service Company ("APS") Saguaro Generating Station, over the Western Area Power Administration's ("Western") Saguaro to Tucson 115 kV line, and 2) the SWTC Bicknell substation over SWTC's Bicknell to Marana 115 kV line. An outage of the Marana to Avra 115 kV line was simulated for this report, and the results show that there is continuity of service to the customers served off of this line.

Attachment 2 of this report contains two maps. The first of these is a single-line drawing of the Project area which includes the entire SWTC 115 kV line from Marana Tap, which is looped between the Saguaro Generation Station and the Bicknell Substation. The second map is an enlarged picture of the Project area that has been highlighted to show the simulation of loss of the Marana to Avra 115 kV line and how continuous service to the Marana and Avra loads is maintained.

Attachment 3 of this report contains load flow single line diagrams simulating the outage of the Marana to Avra 115 kV line for the years 2012, 2016, and 2021. For each year studied, there are two drawings in this Attachment, the first of which shows the Project area with "all lines in service" and the second of which shows the outage of the Marana to Avra 115 kV line. The second drawing for each year shows graphically the flows over the system from the Saguaro

Generating Station into the Marana Substation and the flows over the system from the Bicknell Substation into the Avra Substation, thus preserving continuity of service.

TABLE OF CONTENTS

INTRODUCTION

SWTC proposed the rebuild of the existing 11.98 mile SWTC Marana Tap to Sandario Tap Transmission Line in an application to the Commission which was filed on March 22, 2011. As noted in this application, the Project will use an enhanced design that will accommodate both the current and future needs of SWTC's Class A member distribution cooperatives. The Project begins at the existing SWTC Tap of the Western Saguaro to Rattlesnake 115 kV Transmission Line just south of the intersection of Trico Marana Road and North Trico Road. From this point, the line upgrade proceeds to SWTC's Marana Substation. From there, the line upgrade parallels North Trico Road to its junction with SWTC's existing Sandario 115 kV line located approximately 1 mile south of Manville Road.

The existing transmission line was first constructed in 1961 and, since that time, the conductor has not been upgraded. The existing line is currently at capacity and studies that were performed for the Project application showed that under certain outage conditions existing and future loads were unable to be served without overloading the existing 115 kV line.

To address these issues, the application proposed that SWTC will replace the existing 556 ACSR and 4/0 ACSR conductors of the Project with 1272 ASCR conductor at the same 115 kV voltage. To accommodate this upgrade, all the existing structures will be replaced in order to support the new, heavier conductor. The existing shield wire will also be replaced with an optical ground wire. The new conductor will be non-specular.

During the hearing before the Arizona Power Plant and Transmission Line Siting Committee ("Siting Committee") for the Project on May 3, 2011, various conditions were imposed on the project in order to grant a CEC. The Commission later modified Condition 13 of the CEC to require the performance of a technical study simulating an outage of the Project that may be caused by the collocation of the Project parallel and within 100 feet of an existing natural gas or hazardous liquid pipeline. This report has been prepared to addresses an outage of the Project area to satisfy the modification of Condition 13, herein referred to as Condition 13(b).

SWTC determined that approximately 5.7 miles south of Marana Substation, the Marana to Avra 115 kV line segment of the Project is in parallel for one mile with a SWG 2" high pressure gas line. Attachment 1 of this report shows the location of this SWG 2" high pressure gas line that is parallel to the Marana to Avra 115 kV line. There are no other 115 kV line segments within the Project that lie in proximity to or are parallel to an existing natural gas or hazardous liquid pipeline.

This report outlines the study work associated with simulating an outage of the Marana to Avra 115 kV line, to satisfy Condition 13(b)

CEC CONDITION 13(B)

As noted in the previous Section a hearing by the Siting Committee was held on May 3, 2011 for the Project. The Siting Committee recommended that a CEC be granted (Case No. 161), and on

June 28, 2011 the Commission approved the CEC with the following modification to Condition 13, herein referred to as Condition 13(b), which is the focus of this report:

"Perform a technical study simulating an outage of the Project that may be caused by the collocation of the Project parallel and within 100 feet of the existing natural gas or hazardous liquid pipeline. The study should either: i) show that such outage does not result in customer outages; or ii) include operating plans to minimize any resulting customer outages. Applicant shall provide a copy of this study to Commission Staff and Docket Control."

SWTC has determined that the only segment of line within the Project that is affected by an existing natural gas or hazardous liquid pipeline being parallel to the Project is the Marana to Avra 115 kV line. As noted in the previous Section, a graphic showing the location of a SWG 2" high pressure gas line that is parallel to the Marana to Avra 115 kV line is included in Attachment 1.

SWTC performed a load flow study simulating an outage of the Marana to Avra 115 kV line, and the results of this outage study work are discussed in the next section.

LOAD FLOW STUDY RESULTS

Load flow studies were performed for the years 2012, 2016 and 2021. The following Western Electricity Coordinating Council ("WECC") approved base cases were used to prepare the cases:

Year	WECC Approved Base Case
2012	2014HS3-SA
2016	2014HS3-SA
2021	2021HSIA

The 2012, 2016, and 2021 cases were prepared jointly between SWTC and Tucson Electric Power Company and are the cases that SWTC is using to develop the 2012-2021 Ten Year Plan filing that it will be making to the Commission in January of 2012. The load levels used in the cases are based on the 2011 load and resource forecasts prepared by the Sierra Southwest Cooperative Services, Inc. Planning Department in conjunction with the member cooperatives. These cases include firm transfers as well as the anticipated transmission commitments required to meet the projected load levels in each case.

SWTC used the General Electric Positive Sequence Load Flow program to run the simulations. For this study, only an outage of the Marana to Avra 115 kV line was simulated, as per Condition 13(b).

The Marana to Avra 115 kV line is looped between two sources: 1) The APS Saguaro Generating Station, over the Western Saguaro to Tucson 115 kV line, and 2) the SWTC Bicknell substation over SWTC's Bicknell to Marana 115 kV line. The Marana and Avra 115 kV line is

protected by breakers at the Marana and Avra Substations.

The results of the study for the years 2012, 2016, and 2021 show that under an outage of the Marana to Avra 115 kV line, there is no loss of customer load. The breakers at Marana and Avra are designed to open under faulted conditions to protect the line and continuity of service to SWTC's customers is assured because the Marana to Avra 115 kV line is looped between the Saguaro Generating Station and the Bicknell Substation.

Study results can be found in Attachment 3 which contain the load flow single line drawings of the SWTC system for the years 2012, 2016, and 2021. There are two drawings associated with each year of study. The first of these shows the Project area with "all lines in service" and the second shows the outage of the Marana to Avra 115 kV line. The second drawing for each year shows graphically the flows over the system from the Saguaro Generating Station into the Marana Substation and the flows over the system from the Bicknell Substation into the Avra Substation, thus preserving continuity of service.

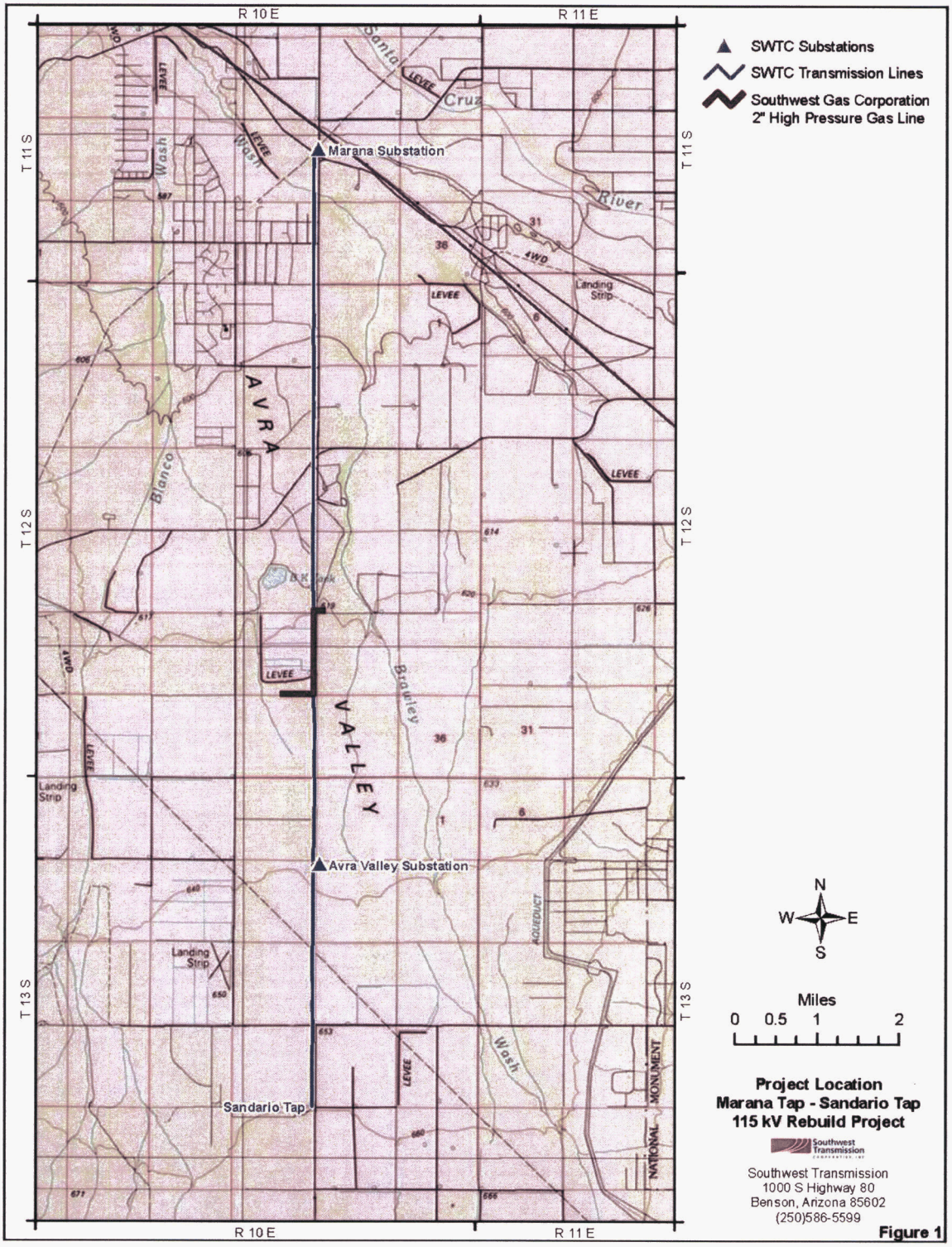
CONCLUSION

This report has been prepared to address Condition 13(b) and shows that an outage of the Marana to Avra 115 kV line, which is a segment within the Project, and which lies in parallel to a SWG 2" high pressure gas line, does not result in customer outages. Outage simulations were performed for the years 2012, 2016, and 2021 to confirm a continuity of service to SWTC customers under this outage.

ATTACHMENT 1

MARANA TAP TO SANDARIO TAP 115 kV REBUILD PROJECT AREA MAP

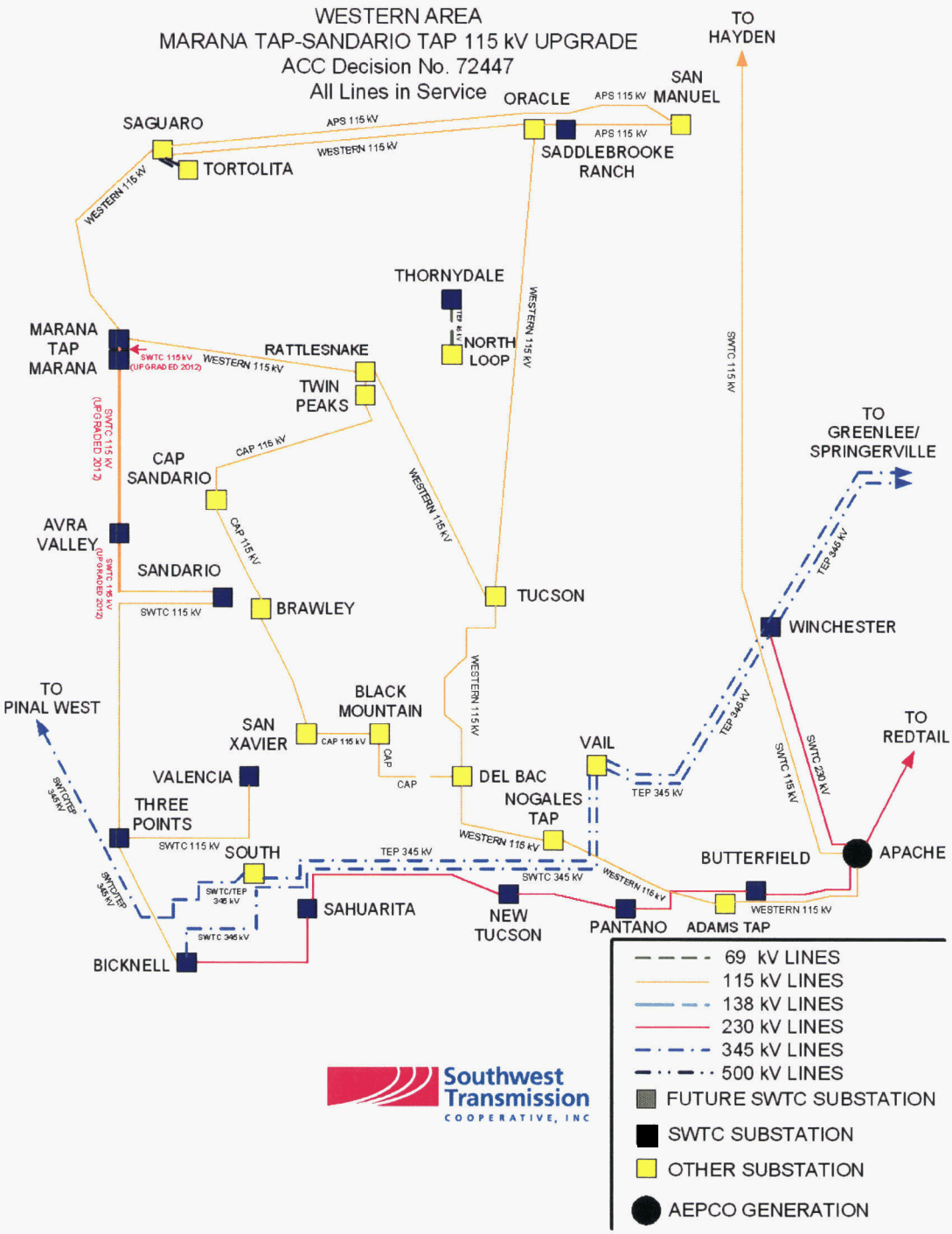
SHOWING SOUTHWEST GAS CORPORATION 2" HIGH PRESSURE GAS LINE


R 10 E
R 11 E
T 11 S
T 12 S
T 13 S
SWTC Substations
SWTC Transmission Lines
Southwest Gas Corporation
2" High Pressure Gas Line
Marana Substation
Avra Valley Substation
Sandario Tap
AVRA VALLEY
Santa Cruz River
Brawley Wash
Blanco Wash
LEVEE
Landing Strip
AQUEDUCT
NATIONAL MONUMENT
4WD
N
W
E
S
Miles
0 0.5 1 2
Project Location
Marana Tap - Sandario Tap
115 kV Rebuild Project
Southwest Transmission
1000 S Highway 80
Benson, Arizona 85602
(250)586-5599
Figure 1

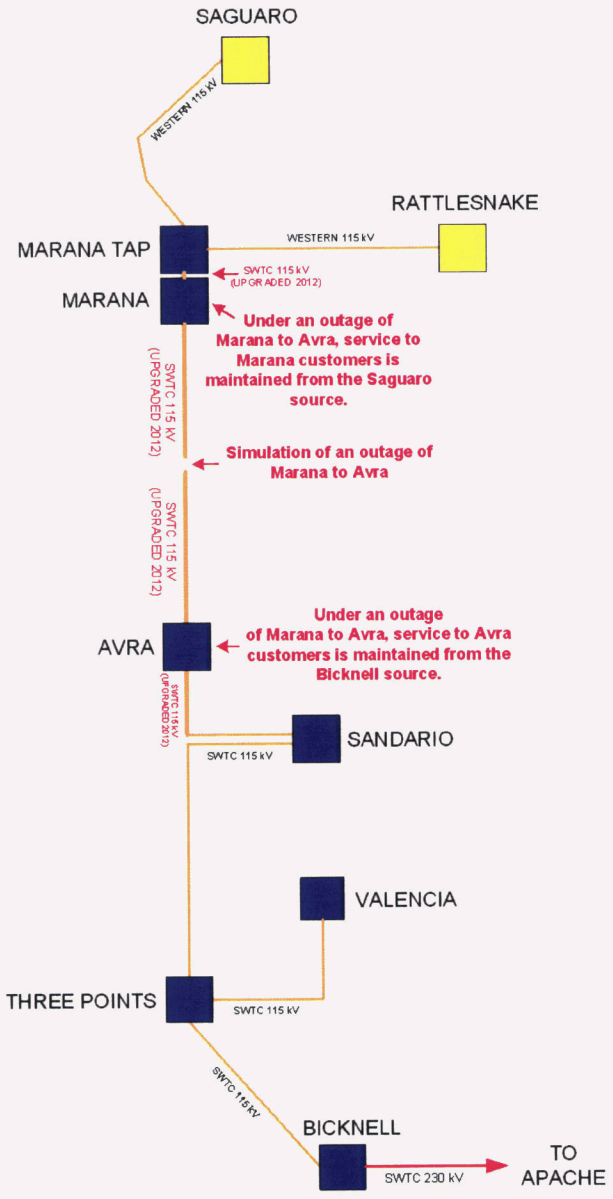
ATTACHMENT 2

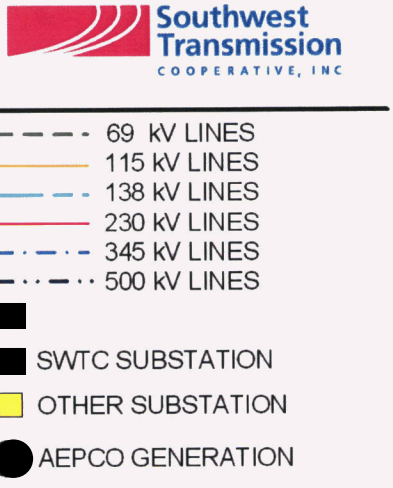
MARANA TAP TO SANDARIO TAP 115 kV REBUILD PROJECT AREA MAP

SINGLE LINE DRAWINGS


WESTERN AREA
MARANA TAP-SANDARIO TAP 115 kV UPGRADE
ACC Decision No. 72447
All Lines in Service
TO HAYDEN
SAN MANUEL
ORACLE
APS 115 kV
SAGUARO
TORTOLITA
SADDLEBROOKE RANCH
WESTERN 115 kV
THORNYDALE
NORTH LOOP
MARANA TAP MARANA
SWTC 115 kV (UPGRADED 2012)
RATTLESNAKE
TWIN PEAKS
CAP SANDARIO
CAP 115 kV
AVRA VALLEY
SANDARIO
BRAWLEY
TUCSON
TO GREENLEE/ SPRINGERVILLE
TEP 345 kV
WINCHESTER
TO PINAL WEST
BLACK MOUNTAIN
SAN XAVIER
VALENCIA
THREE POINTS
DEL BAC
VAIL
NOGALES TAP
TO REDTAIL
SWTC 220 kV
BUTTERFIELD
APACHE
SOUTH
SAHUARITA
NEW TUCSON
PANTANO
ADAMS TAP
BICKNELL
Southwest Transmission COOPERATIVE, INC
69 kV LINES
115 kV LINES
138 kV LINES
230 kV LINES
345 kV LINES
500 kV LINES
FUTURE SWTC SUBSTATION
SWTC SUBSTATION
OTHER SUBSTATION
AEPCO GENERATION

WESTERN AREA
MARANA TAP-SANDARIO TAP 115 kV UPGRADE
ACC Decision No. 72447
Marana to Avra Out of Service



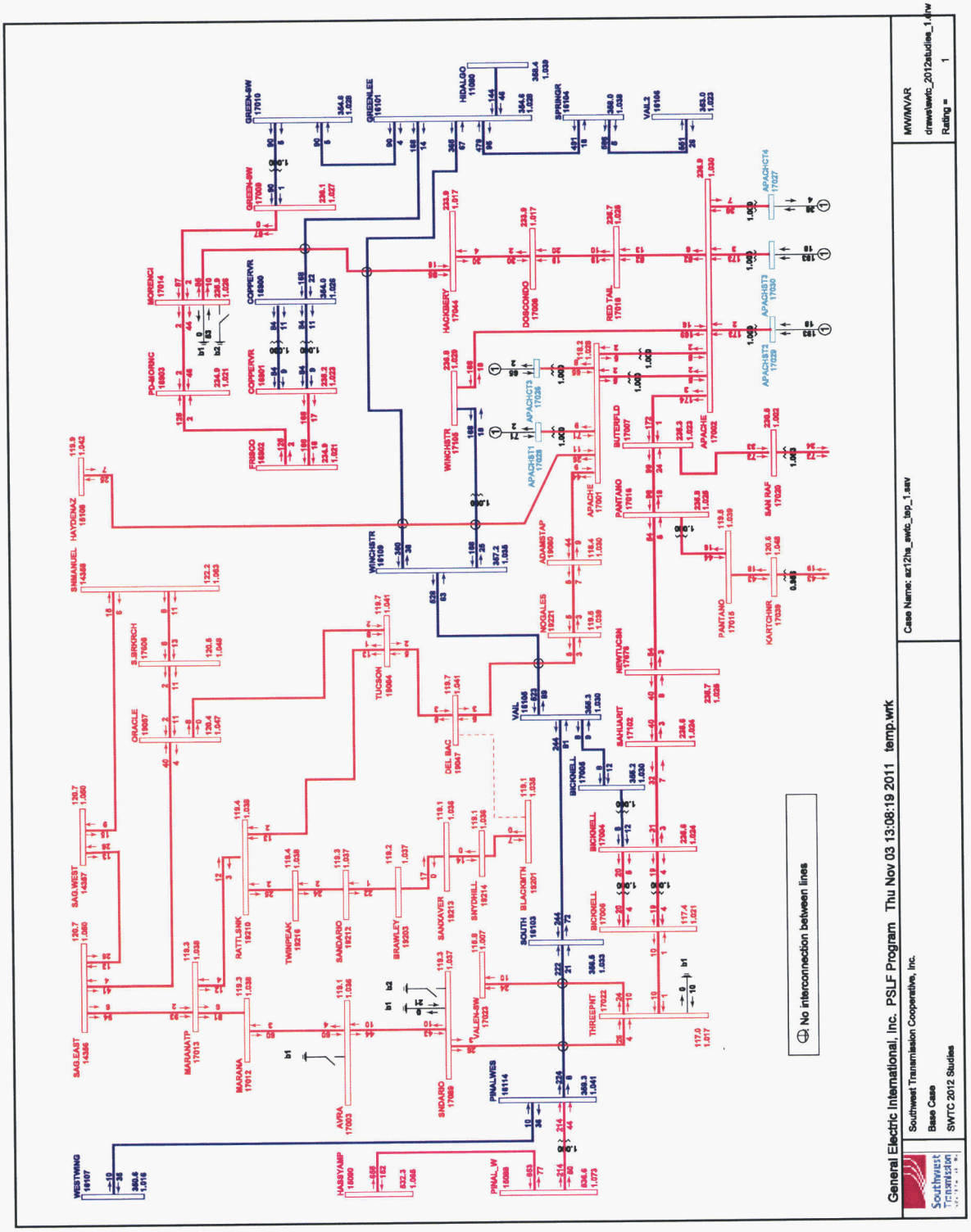


ATTACHMENT 3

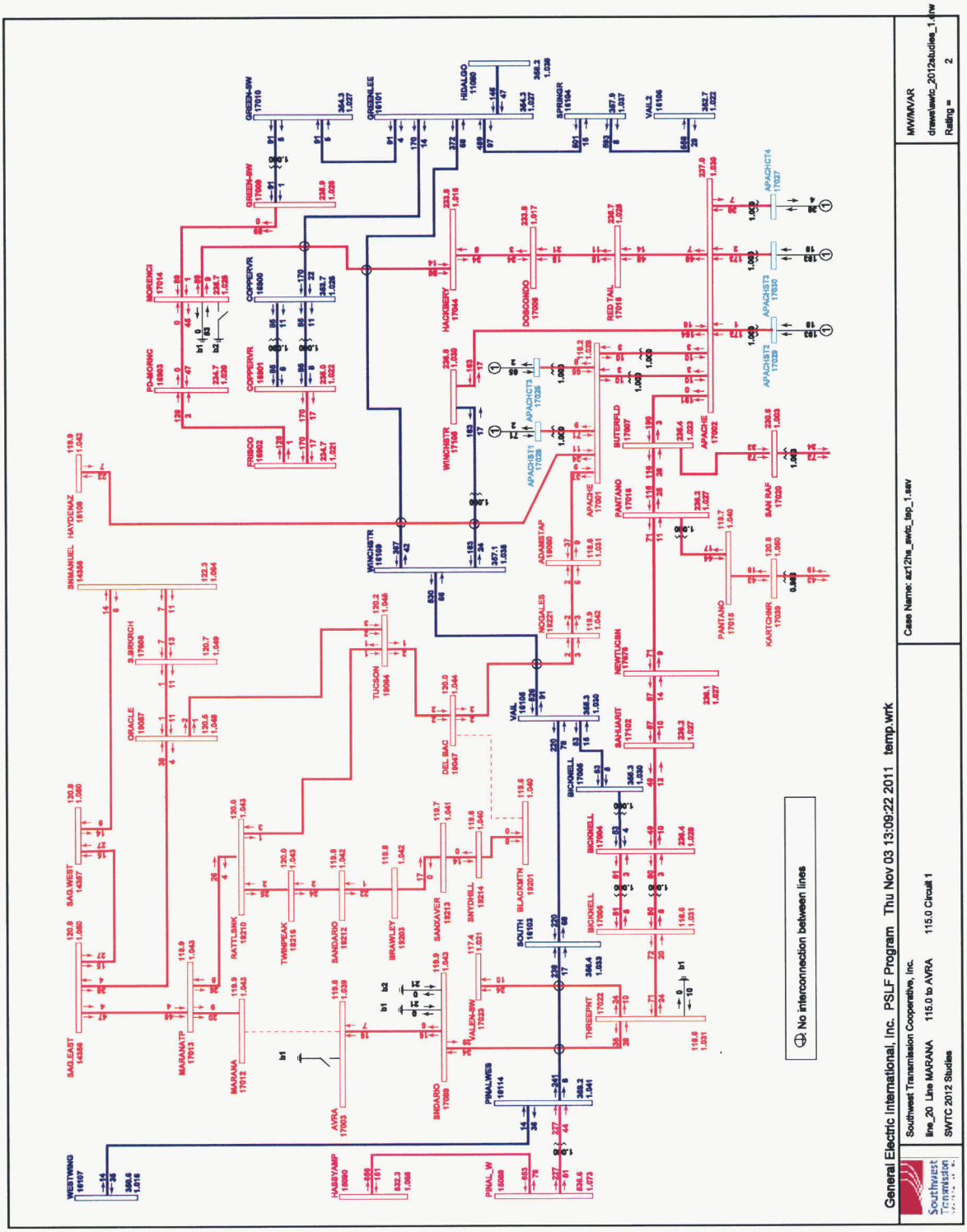
LOAD FLOW SINGLE LINE DIAGRAMS

FOR THE YEARS 2012, 2016, and 2021

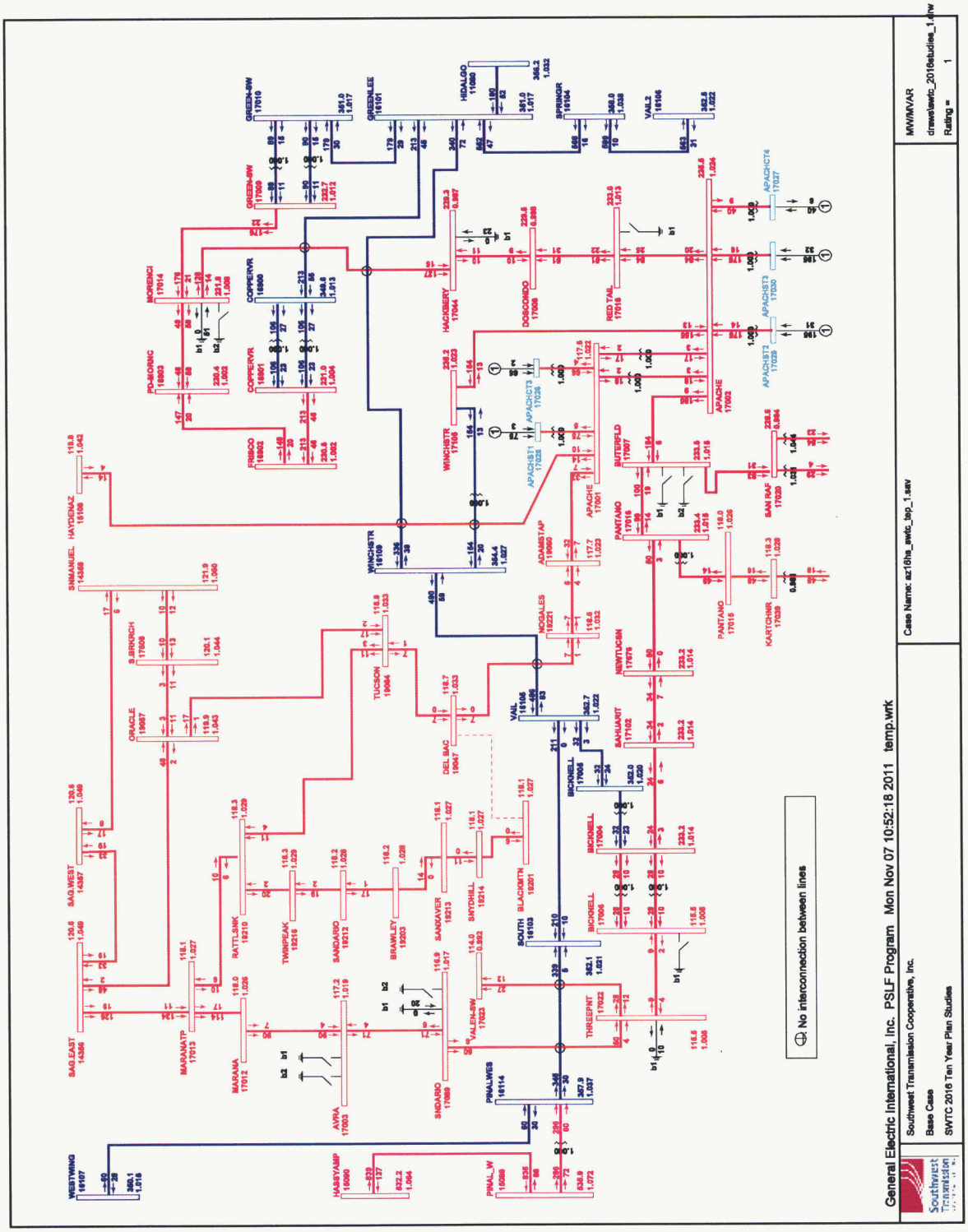
2012HS Southwest Transmission Cooperative Base System



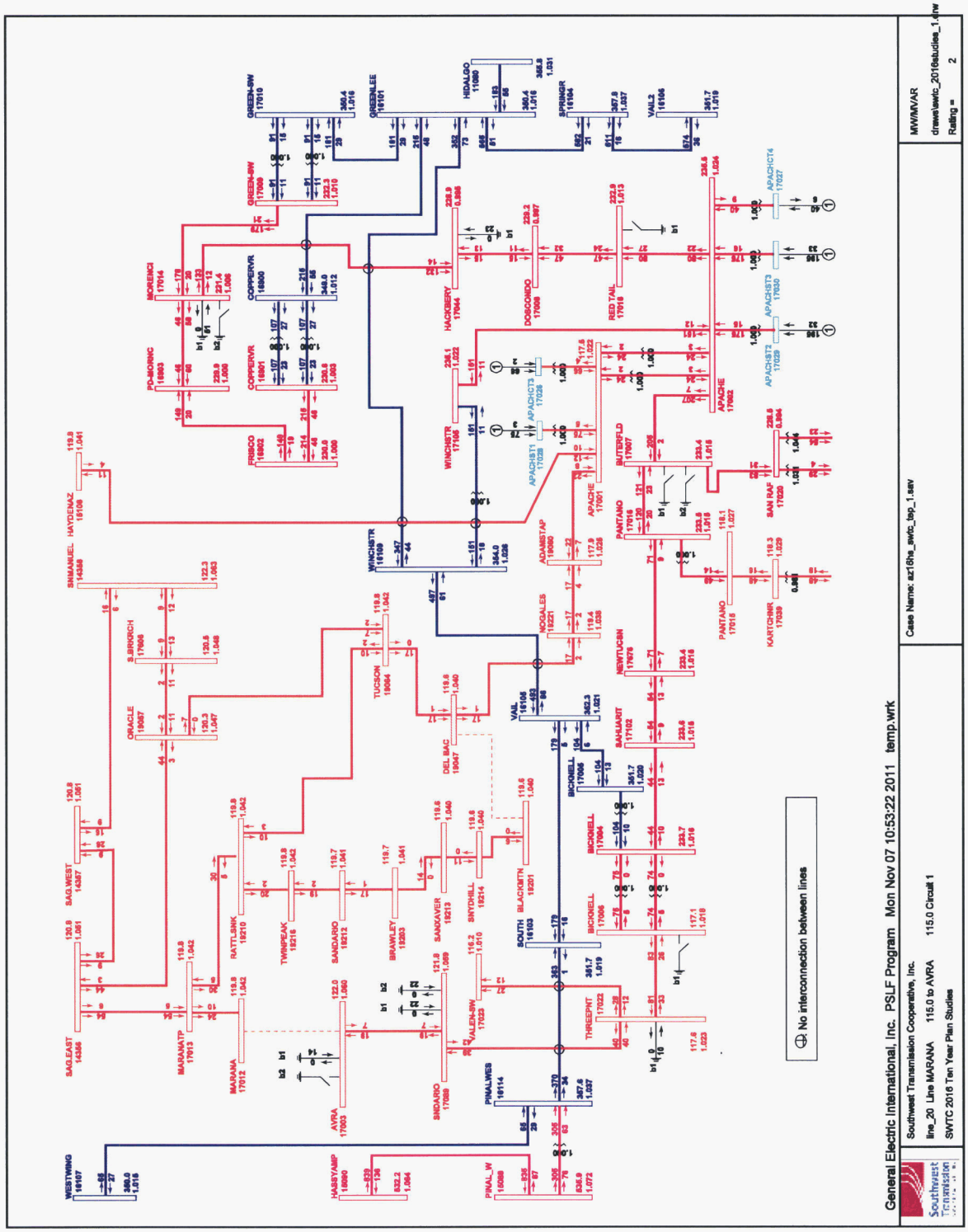
2012HS Southwest Transmission Cooperative, Inc. Base System with the Marana to Avra 115 kV Line Out of Service

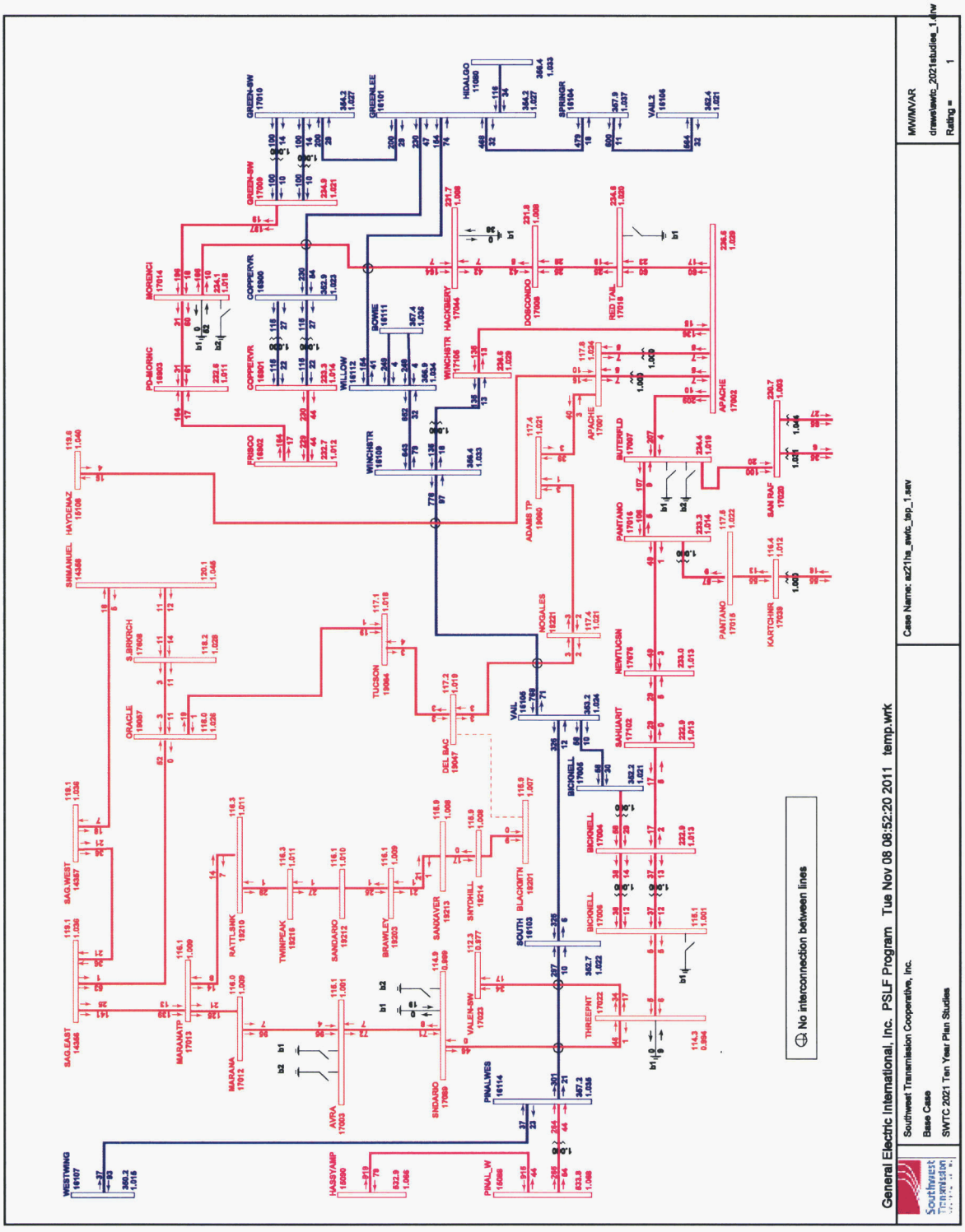


2016HS Southwest Transmission Cooperative Base System



2016HS Southwest Transmission Cooperative, Inc. Base System with the Marana to Avra 115 kV Line Out of Service




General Electric International, Inc. PSLF Program Tue Nov 08 08:52:20 2011 temp.wrk
Southwest Transmission Cooperative, Inc.
Base Case
SWTC 2021 Ten Year Plan Studies
Case Name: ss221hs_swtc_tep_1.sav
MW/MVAR
drawelswtc_2021studies_1.drw
Rating = 1
No interconnection between lines

2021HS Southwest Transmission Cooperative, Inc. Base System with the Marana to Avra 115 kV Line Out of Service